



JULY 1987

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PIKES PEAK RADIO AMATEUR ASSOCIATION, INC.

P.O. Box 16521
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FIRST CLASS MAIL



Ø BEAT



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The Pikes Peak Radio Amateur Association meets on the second Wednesday of each month at Giuseppe's Depot Restaurant at 105, Sierra Madre at 7:30 p.m. All amateurs and interested parties are invited to attend.

Editor: Phil Somers VE1ARC, 1075 Allegheny Dr. Colorado Springs, CO 80919 590-7136



AMATEUR RADIO NEWS SERVICE

ANNUAL PUBLICATION AWARD

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EDITED BY: PHIL SOMERS, VE1ARC
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Dated DECEMBER 31, 1986

N. Carol Shale
VP PUBLICATIONS

Lee Knicker, W9MOL
President. A.R.N.S.

"THE VIEW FROM THE PEAK"

by George Hinds, N8CIX

Riding along as I do, listening to amateurs conversing, from time to time I wonder what it is that gives some people the power to hold my attention, to make me actually happy to listen to them -- and, on the other hand, what is it with some amateurs that causes me to look for an excuse to terminate the conversation, or even to just turn the rig off?

I enjoy talking to people. I certainly enjoy talking to people who are joyful, who mostly have a positive outlook, who express optimism, who are "up" rather than "down." What is it about some people that, when entering a room or a conversation, others about them actually feel better right away? Why are they so easy to talk to, to feel comfortable with?

Then along comes a "downer" -- from the beginning, their words have a negative tone. They complain (and mean it) of how rotten things are, of how someone hates them or they hate someone, they whine and moan.

When I listen to the "downers" I just know that they have never listened to themselves. When face to face, their expression conveys negativism; over the airways, their voice does precisely that, too. I wonder: do they realize that they are setting the stage for others to reject them, sight unseen? These are the people who say "no" frequently; often they complain that no one wants to be with them; always they are "fatalistic" and never "optimistic."

Isn't it strange how unaware we humans are of what our face and our voice conveys to those about us? It's not alone what we say,

but how we say it! Be an "upper" in your attitude and conversations and you'll create an atmosphere that will lead to being accepted rather than rejected.

Do you wonder what your voice conveys about you? Are others tuning you out or turning you off? Strong deodorant won't solve your problem. A change of outlook and attitude will.

A hint. Listen critically to yourself in conversation with others. If you have a tape recorder at home, plus a way to monitor (scanner, your fixed station, etc.), have someone turn it on to "record" when you are talking on the repeater or simplex without your knowing. Or, have another ham friend record your contacts on the air over a reasonable period. The next step: listen to yourself -- and then make some changes in your attitude toward life, toward your fellow human beings, and perhaps in your opinion of your own value to yourself and those about you.

Remember: no one can be expected to be a ray of sunshine every day -- just resolve not to be the daily cloud hanging over all you come in contact with. Don't close people out of your life; do bring them in to share it with you and, in doing so, you'll learn to be positive about each day as you confront it. Wear a smile in your voice as well as on your face. Give happiness to those you talk to; you'll get it back in return while the number of contacts made on that rig of yours will likely pick up noticeably, too!

In conclusion, happiness is something we acquire; we are not born destined to be happy or unhappy. Perhaps it's not too late; work at being a happy person and let your voice reflect that happiness when you're "on-the-air."

Down to Earth Facts About Ground

by Jim WA9ABB

True electrical ground is a common reference point in a circuit that is at the same potential as the earth. Not all earth provides a good ground, because the electrical conductivity varies widely depending upon soil conditions. The best true ground is the ocean or salt marsh. Next best is the earth itself. The poorest ground is dry, sandy or rocky soil of low mineral content (does that sound like Colorado Springs?).

If ground resistance is high, considerable noise voltage may develop between the earth ground and the equipment that is attached to it. The ground resistance is a sum of the resistance of the ground lead and ground rod driven into the soil, and the resistance of the earth surrounding the rod. The rod-to-earth resistance is usually negligible compared to the resistance of the earth around the soil. Most of the effective resistance is within a radius of six to ten feet of the rod.

Moisture content and soil temperature also affect ground resistance. Increasing soil moisture from 10% to 35% can lower soil resistance from 350,000 ohm/cubic centimeter to 5000 ohm/ccm. A temperature change from 70 degrees F to 0 degree F can increase soil resistance from 80 to 200 times. So Frozen soil does not provide a good ground return. That is why the ground rod needs to be long enough to get below the frost line.

A good ground rod should be 8 to 10 feet long. The diameter of the rod is not terribly important. A one inch diameter rod has only 7% less resistance than a 1/2 inch diameter rod. Half inch copper water pipe in 10 foot lengths usually costs only a few dollars and makes a very good ground rod. It is easily put down by connecting a garden hose and letting the water pressure do the hard work for you. You can not drive copper pipe with sledge hammer. Electrical connection can be made with a stainless steel automobile hose clamp or you can solder directly to the pipe. The braided shield of old R88 coax is a good conductor from the rig to the ground rod.

A ground resistance greater than 34.5 ohms is considered high. Electrical codes in many cities specify a resistance of less than 25 ohms. You can lower your ground resistance by driving the rod deeper into the earth, but that is mechanically difficult for the average ham. An easier solution is to put down two additional ground rods about six feet from the original. This can cut the ground resistance to 1/3 of its original value.

Theoretically your rig should be located right at the ground rod. The ground lead from the rig to the rod should be as short as possible. A sixteen foot ground lead is about 1/4 wavelength on 20 meters. It will act like a high impedance and the equipment for RF purposes is effectively removed from ground, even though it might still function as an electrical d.c. ground.

These and many other facts can be gleaned from the "Interference Handbook" by William R. Nelson, WA6FGB. Hope the above info will make you a little better rounded and grounded. HI!

HINTS FOR PIKES PEAK HILL CLIMB

by Phil VE1ARC

WHEN: Saturday - 11 July 1987

WHERE: Exit from US 24 between Colorado Springs and Woodland Park.

ARRIVE: Friday if possible - only night of the year you can camp on Pikes Peak. This year, no camping above treeline to protect environment.

BRING: Warm clothes. It can get very cold

DRINK: Lots and lots and lots of water. So easy on the B07s.

PARTICIPATE: For visiting hams, join forces with one of our checkpoints, lend your HT for back-up, help out. You will find it much more interesting.

MOST IMPORTANT: After the race, it will take at least 2 hours in BUMPER-TO-BUMPER frustrating traffic to get off the Peak. Much better to plan a hike, a barbeque, work some VHF Dx, eyeball QSO or whatever. I'M NOT KIDDING !!!!!!!!!!!!!

VHF & ABOVE NEWS by NKØP

The June VHF Contest was busy this year. Many mobile stations were out in Colorado, Wyoming and New Mexico to give that rare Grid Square. Six meters was open for a good portion of the contest period with one station reporting contacts as fast as he could work them!

With Field Day over its time to look ahead to the next contests. 73 Magazine has announced the "Golden Gigahertz Contest" from July 18 0001 GMT to July 19 2400 GMT. Contest Frequency 1260 to 1300 MHz. This contest is especially interesting because ICOM will send you a FREE Hat and T-Shirt just for sending in a log sheet. No minimum amount of contacts needed. For details see June 73 Magazine. NOTE: The contest dates in June 73 are wrong. The ones printed here are the correct ones. July meteor shower is the Delta Aquarids July 28 1987 1440 GMT +or- 12Hrs.

Moon perigee for July is the 11th. New moon is the 25th.

The next two short articles are reprinted from the VHF & Above Information Exchange. I hope they are useful to some of you.

73 and C U on the bands.

VUCC PROCESSING INFO

From : Steve Lund - WABLLY/6

I am quite concerned that someone might use Certified Mail to send their valuable QSL's. Certified Mail travels with the First Class Mail and is not accounted for except at the delivery point. It also can NOT be insured. Thus if your QSL's are lost or destroyed all you get is a receipt that this happened. This certainly is not what you want to do. It is much cheaper to include an SASE with your application and have the award manager return it when your package arrives safely.

If you decide your QSL's are worth something, send them via Registered Mail. Be sure to declare a replacement value of at least \$5.00 per card. If you don't declare a value, the USPS will not pay a claim for replacement! If you are asked what you are sending just tell them that they are "collector cards".

I have a great deal of sympathy for Kent's problem of getting to the Post Office for Registered Mail. Fortunately I go to the Post Office several times a week and will gladly process your VUCC application.

The address is: Steve Lund - WABLLY/6; 10180 Hill Station Rd.; Sebastopol, CA 95472. VUCC Manager 1810.



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ATTENUATION MEASUREMENTS WITH A BIRD 43

By: George Chaney - W5JTL

Would you like to use your Bird 43 to make precise measurements in very small increments? It can be very useful in checking out your transmission line and all of its components - relays, connectors, power dividers etc.

Simply connecting a DVM, in its millivolt range, across the DC terminals of the Bird meter movement is all that is needed for the conversion. I brought the leads out the back of my Bird 43 with a short piece of RG-58 coax, center + and braid -. There will be slight variance between individual meters, but one of mine indicated 42.7 mv full scale and 8.4 mv at 1/10 scale. Ignoring the decimal point, which is of no value for our purposes, this gives us a lot of numbers to play with.

With the DVM connected, a table was prepared showing the digital indication at each one-tenth scale division on the Bird, as well as the difference to the next higher division. While this was done with a 10 watt element, it would hold true with any slug, as it is simply the DC voltage across the meter movement. An infinitely variable source of RF will be required. Table 1 was prepared with my IC 1271 into a very good dummy load.

BIRD	DVM	Difference
10	42.7	-----
9	40.3	2.4
8	37.5	2.8
7	34.8	2.8
6	31.4	3.2
5	27.9	3.5
4	23.6	4.2
3	19.2	4.4
2	14.4	4.8
1	8.4	6.0

TABLE 1

ANTENNAS
By Chris Smith NXØt

Summer is the time of year that noise gets to be a problem on the HF bands. Thunderstorm activity increases, causing the familiar sound of "static crashes." At times it gets to be next to impossible to work DX and difficult to work closer stations. At such times it can be useful to make use of the different angles of arrival of signals and noise by exploiting the narrow beamwidth possible with gain antennas. A little analysis of the situation will reveal how.

The station you want to hear is sending a signal that arrives at your antenna at some azimuth and angle of elevation. In fact, it may be arriving at more than one angle (a situation called multimoding) but usually one of the signals is at least 6db stronger than the next strongest and may be considered as the only signal of interest.

The thunderstorms causing the noise could be most anywhere. They could be extremely local, in which case you have better things to do than work DX. They could be co-located with the station that you're trying to work, so that the noise they produce is arriving at the same angle as the desired signal. In that unfortunate case, no antenna can separate the signal from the noise. The op at the other end probably has something better to do than working DX anyway. However, the thunderstorms may be distant, but within a skip zone, or within ground wave distance. In fact, the odds are much greater that this is the case because the area that can affect you is so much bigger than the area immediately around your station or the other station.

In the latter case, an antenna can separate the signal from the noise. This is because a gain antenna or "beam" responds much more strongly to signals from the "beam" direction than from other directions. Indeed, that is how the beam achieves its gain - it can't pull more signal out of the air unless it rejects signals from some other direction. It is because the noise is coming from those other directions that you can improve the signal to noise

ratio. Copy becomes easier.

As a practical matter, HF antennas don't control their elevation pattern. They are steered in azimuth, but significant gain (and a narrow beamwidth) can still be achieved.

Assuming the other station can hear you well enough, you only need to use a beam on your receiver. This is significant because receiving antennas can be much easier to build. They don't need to offer high efficiency, or low VSWR. Technically speaking, if your antenna and receiver combination is "externally noise limited" (and on the lower HF bands almost all are) then it is optimum in the sense that you don't need any further improvements in efficiency or VSWR.

An example of this is the use of loop antennas for receiving. You wouldn't want to transmit on one! But they can add some directionality - usually in the form of a null which can be pointed in the direction of some offending QRN or QRM. Commercial communications stations carry this a little further by employing a loop array antenna, which combines several loops in such a way as to produce a narrow unidirectional beam. Many such stations use multicoupler-amplifiers to produce many such beams simultaneously for use by several operators. The cost of such receiving antennas with associated electronics is quite a bit cheaper than providing as many transmitting beam antennas.

The ARRL Antenna book shows several suitable receiving antennas under "direction finding." Many of the classic antenna text books as well as some of the newer ones will also have discussions of suitable narrow beamwidth receiving antennas.

WANTED

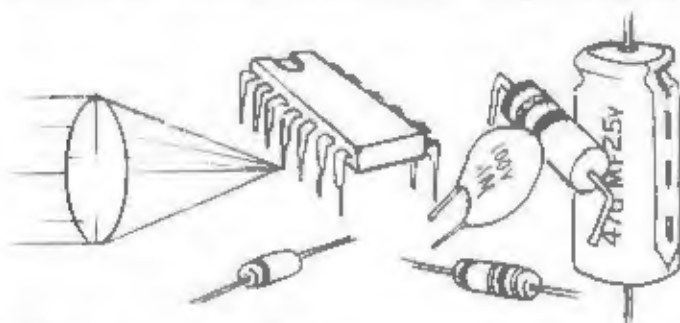
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Ron - NKØP 593-8352

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To make room for more merchandize, OEM Parts is moving down the street to 3031 N. Nevada, just north of Filmore on the east side of Nevada. They hope to be there by late June, and promise that even when they get super organized that they will maintain a room where Hams can still rummage for "junk". Lets continue to give OEM our support as they grow so we will have an excellent surplus outlet. By the way, OEM kindly donated a \$20.00 gift certificate for our last club meeting.

QST QST QST

WIN! ICOM 2AT!!!!!!!

An ICOM 2AT Handi-Talkie will be raffled off at our annual club picnic! Tickets are available starting June 1st from Ron NK6P at Saturday breakfasts or at the June and July club meetings for \$1 each. You need not be present to win. If we can break even on tickets sales we will plan for another major prize to be given away at the Christmas Party.

LONG QSOs ON REPEATERS

by Norm N0CGP

I felt it a privilege when I received my license and was quite proud, but in all my studies for examinations, I nowhere got the impression that Amateur Radio was intended to replace Ma Bell and the Postal Service. I feel that the use of the repeaters is grossly abused by long winded Hams.

It is certainly appropriate for a Ham to call a friend about a problem he has with his equipment, but I do not believe that it is appropriate for the responding party to tie up the repeater for a lengthy period of time to give a detailed explanation of how to modify the rig or how to build an antenna farm.

I also believe that it is desirable to get acquainted with other Hams, particularly someone from out of state or visiting the area, but again, in my mind, the repeater is not the place for either party to give a detailed autobiography of their activities from birth to present.

I am sure that all this is unintentional and they do get carried away, but they do not realize that these long conversations block out all scanning. Most of us have scanners or scanning radios which become useless if anyone hogs a frequency. As I recall the FM Association has two frequencies designated for "rag chewing" and there are of course simplex frequencies which are open at most times.

Sorry for expressing my opinion, but I do feel that the repeaters should be available as much as possible, particularly in severe weather or even in local emergency situations. Several areas up in the "hills" are completely isolated and have no 'phone service' and cannot get phone service. They rely entirely on radio for communications.

JULY MEETING

The next regularly scheduled meeting of the Pikes Peak Radio Amateur Association will be held on Wednesday, July 8 at 7:30 PM at Giuseppe's Depot at #10 S. Sierra St. The program will be on a mystery topic by a mystery speaker.

WHICH PACKET PROGRAM SHOULD I USE FOR MY IBM PC (CLONE)?

by Keith KEMMS

You have just acquired a new TNC (packet controller) that you want to operate with your IBM PC or clone and now you are left with the dilemma of deciding which terminal program you should use with your PC to best manipulate your TNC.

Being the author, I will subject you (hi) to the criteria that I thought were important to me in the selection of a terminal program. For myself I was looking for the following features:

1) The program should be able to offer help menus to the user in case he runs into problems while operating and he needs to overcome them on the fly.

2) It should initialize the TNC with specific values that are required for a particular session.

3) It should have a DOS shell that can be accessed while the program is operating.

4) It should incorporate abbreviated keystroke features to alleviate lengthy command entry or connect requests.

5) Split screen operation is a must.

6) ASCII file transfer is a must and Binary file transfer is highly desirable.

The three options that I considered were terminal program to support modem (such as Procomm or Telix), a program called PACKCOM designed specifically for packet radio use, and a program called YAPP, another program designed for packet radio.

MODEM PROGRAMS

Procomm and Telix are by far the most widely used and some would argue that Procomm is the standard for modem communications over telephone lines. These two programs do adapt themselves to packet radio quite easily, but they do fall short in a couple of areas. They suffer through the lack a viable method

to efficiently transfer binary files through the TNC, the lack of extended initialization routine to set up the TNC when the program is first executed and the lack of abbreviated keystroke routines to speed up packet operation. These programs are excellent when it comes to DOS access and they do support a host mode which can be adapted to allow other users to access your DOS and manipulate your system. Split screen operation and help files are available with both these programs. Overall, these program are very good when it comes to supporting packet operation, but one must remember that they were designed for telephone modem use only.

PACKCOM

This is an excellent program designed by a Packet Group in Alaska (to the best of my knowledge) and it can operate with virtually any TNC. The thing that impressed me with this program was the abbreviated keystroke routines supporting over thirty commands/connect request sequences (which can be programmed by the operator). This is particularly handy if one wants to input commands very quickly on the fly (such as changing the TXDELAY or MYCALL if there are two hams in the family). Another feature, although minor that pleased me was the way in which the program took the time from the PC and transferred it to the system clock of the TNC during initialization of the TNC (this is only item this program initializes on the TNC to the best of my knowledge). The help screens that are available on this program are excellent and are very user friendly. Although the program will allow you to execute DOS commands one at a time after requesting it as a function, it does not offer a true DOS shell where one can enter DOS, and then exit when one is finished. Another drawback of this program is its inability to transfer binary files efficiently using the TNC in a transparent mode. It does offer a split screen capability. Overall this is an excellent program.

YAPP

YAPP is Yet Another Packet Problem developed by WA7MBL to support users accessing the many MBL PBBS' around

the United States and Canada. Its two main strengths are its ability to transfer efficiently binary data files (programs and ASCII files) and the initialization routine it employs to configure the TNC when the program is first executed. One drawback to the file transfer capability is that it is TNC specific in that it mainly supports TAPR TNCs and their clones and others may require some reprogramming (to my knowledge, it will support all TAPR TNCs, their clones, AEA, and Kantronics). The protocol used is the YAPP protocol and I have used it successfully several times to upload and download files of various sizes to and from the local PBBS and other stations. The help menu is good and it does employ split screen operation. It does incorporate a true DOS shell and it certainly comes in handy when one is trying to manipulate files. The only keystroke abbreviation it employs are for connect sequences only. Overall, this is an excellent program.

What would I recommend? It depends on what you like to do on Packet Radio. If file transfer (especially binary) is your thing, then I can only recommend YAPP. If user-friendliness (help menus and abbreviated keystrokes) is what you are looking for, then PACKCOM is your program. As far as I know, both programs are public domain, although the authors don't complain when they receive financial support for their efforts.

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There are no doubt other programs out there(?) for the PC to be used in Packet Radio applications and probably better than the ones that I have described. You are encouraged to go out and try what is in the marketplace. I hopefully have provided some insight about the programs that I know about and this may help you in your selection of a program to use.

73 --- Keith --- VE3PDD / KEØM6

To use the table, and convert the numbers to power, simply note the reading of the DVM without the device being tested in line. Then put the device in line and again note reading. Assume that there is indication of 22.5 on the DVM without the tested device in line. This will be 3 watts plus 33/44 or 3.75 watts. Now, with the device to be tested in line, with the same power input, there is a reading of 22.3. This will be 3+31/44 or 3.704545455 watts. The difference between the two power levels comes out at 0.05298339 dB. Quite an accomplishment for our old workhorse Bird!! I don't know what device we were testing, but if it's that good I surely want one.

I don't get very deep into the proper technique of using the thing, simply because I don't know. I used two Bird 43's because I wanted to monitor the input power to see that it remained constant. Because Kent (WASVJH) told me it was the thing to do, and with no further knowledge on my part as to why, some attenuation was put in the line before the device tested. A 80 foot section of RG-213 was used as an attenuator at 1296 MHz, which had close to 0.1 dB loss per foot. The RG-213 was cut and device tested was inserted at this point. Since connectors were required, they were necessarily included in the results - unfortunate but unavoidable.

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MINUTES OF JUNE GENERAL MEETING
submitted by Al NØCMW, secretary

The general meeting of the Pikes Peak Radio Amateur Association was held at Giuseppe's Old Depot Restaurant, Wednesday evening 10 June 1987. The meeting was called to order by the president Don KEØBJ at 19:30.

The minutes of the previous General Meeting and Board Meeting were approved as printed in B-Beat.

Committee Reports

Note: Anyone wishing to help out on any of these committees, please contact the chairman at the phone number listed. Thank you for your support.

Treasurer - Bud NØDDF (599-7699):
Balance as of 13 May \$1425.59, income \$1634.00, expenses \$483.58, Balance as of 10 Jun \$2576.01.

Interference - Ron NKØP (593-8352):
Nil

SwapFest - Jim WA9ABB (598-7543):
Jim presented a gift certificate from Miley's Radio to George NØCIX for most tickets sold for the raffle. Thanks to everyone for making the raffle a success.

Pikes Peak Hill Climb - Malcolm KE9S (488-2071): See Program

Education - Les KCØNC (634-3995):
Nothing planned until winter.

Publicity - Rick WB7THT (599-7655):
Rick has a media package for publicity for Field Day.

Colorado Council of Amateur Radio Clubs (CCARC) - Bud NØDDF (599-7699):
Nil

Deaf and Blind School - Jim WA9ABB: (598-7543): Speech synthesizer has arrived and will be installed in D&B IC-730. School is out for the summer. Chris NXØE reported that it may be possible to fix up a radio room during the summer.

B-Beat - Phil VE1ARC (590-7136):
Extra B-Beats available for guests.

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TAB BOOKS

AREB - Jim WA5BKKI (579-9129):

Jake NØCYR reported that the last antenna has been installed on Eisenhower Hospital. A move of the antenna on the old hospital at Fort Carson to the new hospital is planned. City Health Dept has asked for an antenna.

Public Service - Mike KØTER (636-1290):
Muscular Dystrophy had requested some communications help. It was borderline so a request was sent to FCC for a decision. Enduro still needs a chairman.

Club Trailer - Pete NØLA (495-4829):
Nil

Field Day - Max KDØEL (590-9849):
See Program

VE Testing - Pete NØLA (495-4829):
There were 9 upgrades on the SwapFest testing. Apology for some confusion at the test site. The next session will be back at the church on 15 August.

Old Business:

Doc WØMCT thanked all the participants in the Teller County Hill Climb.

Bylaws: New set will be presented at the next meeting.

New Business:

Frank KL7IPV moved that club buy antenna for Health Dept. Estimated cost \$45. Passed.

Announcements:

Ron NK0P reminded everyone that the raffle prize at the Club Picnic in August will be an IC-2AT. Need not be present to win. Get tickets now.

Mountain ARC Swapfest in Woodland Park Jul 25-26.

Prizes - Ron NK0P:

Winners were:

Joe	KQ0S	\$10. Wintronics
Harley	KC0TQ	Bumper mount
Susan	KA7NNX	New repeater directory
---	N0BYI	ARRL Handbook
Keith	NY0T	Woodland Pk raffle tickets
Chris	NX0E	\$20. OEM Parts
Phil	VE1ARC	\$10. Centennial
Frank	N0FX	Woodland Pk raffle tickets
Oak	K0ROL	Repeater directory
Mike	K0TER	Advanced manual
Al	N0CMW	Computer magazine
Rene	KA0RGY	Repeater directory

Program:

Field Day - Max K00EL passed out maps for the FD site. The novice station call will be KA0ZHP with Nick K05N in charge. FD dates are 26-27-28 Jun on Rampart Range Road near Woodland Park. Talk-in on 146.52. Jake will have ARES station. CW station run by Mike K0TER in club trailer. Phone will be in an AFA trailer run by Doug and Harvey. Sign-up for operating times for both stations. Lucy in charge of supper Saturday night. Permit for site was \$50.

Pikes Peak Hill Climb - Malcolm KE9B presented a talk and slide show on plans and highlights of the hill climb. Lots of check points and very busy time on the hill. Need to attend the training classes. Very interesting presentation Malcolm.

The meeting was adjourned at 21:30. The next board meeting will be 15 June at the QTH of Chris NX0E. Next general meeting will be 8 July.

MINUTES OF JUNE BOARD MEETING submitted by Al N0CMW

The board meeting was held on Monday 15 June at the home of Chris NX0E. Meeting was called to order by pres. Don KE0GJ at 1900 hours. Present were Chris NX0E, Al N0CMW, Bud N0DDF, Don KE0GJ, Jim WA9ABB, Phil VE1ARC, Nick K05N, and Susan KA7NNX.

Copies of revised by-laws will be at next general meeting for viewing and adoption. See Bud N0DDF for an advance copy. Chris reported that he was still waiting for info he had requested on an emergency antenna. Endura Paul NE0H and Mike W9MHL will set it up. Don KE0GJ will follow up on it.

Club will pay for the two Field Day meals. Treasurer reported on the final figures of the Swap Fest. They will be printed in 8-Beat.

No further business, board adjourned at 9 PM. Location of next Board meeting TBA.

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We will be closed the following dates for Hamfests:

July 4-5-6 Closed with a BANG!
July 9-12 Douglas, WY
July 16-20 East Glacier, MT (will be closed
July 10-24 for Douglas & East Glacier. Will
return for Woodland Park Hamfest July 24-27)
August 7-8-9 Amarillo, TX
August 9 Jeffco Fairgrounds - Denver
Sept. 4-5-6 Labor Day - Alamogordo, NM
Sept. 11-13 Camp out Hamfest - Medicine Bow
National Forest Campground near Laramie, WY

Due to Hamfest season, we are not running a product listing this month - we have (or can get quickly) nearly all ham equipment advertised by major companies and distributors in current ham catalogs and magazines and most at lower prices. If you call and get our answering machine, please leave your name and number and a message up to 1 minute long - we get them daily and will call you back, or if you leave an order and your address, we'll ship it that day or next.

Some specials on New Equipment

Kenwood TM221A - 2 meter FM 45 W rcv from 138-174 MHz w/TTM - \$355.
Kenwood TM421A - 70 cm 35 W w/TTM \$365.
Kenwood TM2530 - \$349.
Kenwood TM2550 - \$379.
Kenwood 2570 - \$449.
Kenwood TS440S w/AT - \$1000.
Kenwood TS430S - \$740.
Icom 28H - Now with TTM - Sale \$425.
Icom 28A - Now with TTM - Sale \$398, w/o TTM - \$365.
Icom 735 - Sale \$798.
Yaesu FT 767GX - \$1425.
Yaesu FT757GX - \$765. Mark II - \$945.
Yaesu FT727R - 2M/70 cm HT - \$398. New CPU.
Yaesu FT23R - \$265. w/TTP.
Kantronics KAM - \$275.
MFJ 1274 VHF/HF Packet Controller \$139.
AEA PK 232 w/FAX - \$298.

We have a constant flow of good clean used and consigned equipment.

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Thanks for your support, — Jess KØTAA

We'll look forward to seeing you at one of the hamfests!

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Associate Member \$8.00 ☐ (Outside Teller & El Paso Counties.)